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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/697,179	10/27/2000	Nobuaki Mitamura	1344.1046/JDH	4454

21171 7590 08/06/2003

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EXAMINER
SUCHECKI, KRYSTYNA

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/697,179	MITAMURA ET AL.
	Examiner	Art Unit
	Krystyna Suchecki	2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The term "increase" (understood to have meant "increased") in claim 14 is a relative term which renders the claim indefinite. The term "increase" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Several embodiments are given, encompassing negative and positive movement in the temperature dependency of a transmission wavelength characteristic, however, there is no language in the claim to describe from what point the dependency is moving, nor if the dependency is increasingly negative, or increasingly positive. Further, the language lends no understanding whether the increasing occurs per degree of temperature change, or if the value is simply larger than some predetermined number.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (US 5,167,444) in view of Shirasaki ("Temperature Independent..."ECOC Document, referred to as "ECOC" herein).

6. Regarding Claim 1, Figure 2 of Hall teaches an airgap type etalon comprising:

a. a fixing member (36) having at least one flat surface;

b. a first parallel member (37), which is transparent to incident light and has parallel flat surfaces, one of said parallel flat surfaces thereof being joined to said flat surface of said fixing member;

c. at least one second parallel member (40), which has parallel flat surfaces in which a distance between said parallel flat surfaces thereof is greater than a distance between said parallel flat surfaces of said first parallel member, one of the flat surfaces of said second parallel member being joined to said flat surface of said fixing member so as to surround the outer periphery of said first parallel member (Column 4, lines 62-65); and

d. a transparent member (38), which is transparent to incident light into and has opposite flat surfaces, one of said flat surfaces thereof being joined to the other flat surface of said second parallel member, said other flat surface being opposite to the joined surface to said fixing member;

e. wherein a Fabry-Perot interferometer is formed based on an airgap positioned between the flat surface of said first parallel member and the flat surface of said transparent member facing each other (Column 2 and Figure 2) and wherein a distance between the parallel flat surfaces and the expansion coefficient of each of said first and second parallel members, are set to obtain temperature dependency of a transmission

wavelength characteristic capable of compensating temperature dependency of incident light (Column 4, lines 31-68).

7. Hall teaches the use of two materials of dissimilar coefficient of thermal expansion in a composite in order to effectuate a low coefficient of thermal expansion (Column 4, lines 31-48).

8. Hall fails to teach a second parallel member having an expansion coefficient different from that of said first parallel member.

9. ECOC teaches that materials of dissimilar coefficients of thermal expansion can be combined for the purpose of forming an etalon with a low coefficient of thermal expansion (ECOC, Section 3). ECOC teaches the selection of one athermal material (athermal glass) and a thermally influenced material (fused silica) (Section 2). By choosing the appropriate materials and thicknesses of the materials, the distance between the parallel flat surfaces of ECOC and the expansion coefficient of each of said first and second parallel members can be set to obtain temperature dependency of a transmission wavelength characteristic capable of compensating temperature dependency of incident light (Sections 2 and 3).

10. Since Hall and ECOC share a similar goal in the art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use separate materials as taught by ECOC, namely the use of an athermal material, which Hall already teaches, and a thermally influenced material, for the first and second parallel plates in the system of Hall in order to form an etalon with a low coefficient of thermal expansion, wherein the optical distance of said airgap is set to affect the temperature characteristic of the transmission wavelength characteristic.

11. Regarding Claim 3, Hall teaches an airgap etalon above wherein said fixing member is transparent to incident light.

12. Hall fails to teach said fixing member is formed with an antireflection coating on a surface opposite to said flat surface and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member.

13. ECOC teaches antireflection coatings on the entrance and exit sides of an etalon (ECOC, Figure 3). Antireflection coatings are known in the art to be used for the purpose of preventing backreflections.

14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include antireflection coatings on the entry and exit surfaces of the etalon of Hall as taught by ECOC for the purpose of preventing backreflections.

15. Regarding Claim 4, Figure 3 of Hall teaches an airgap type etalon wherein reflection augmenting coatings (54 and 56) are formed on said flat surfaces of said first parallel member and said transparent member facing each other, respectively.

16. Regarding Claim 7, Hall as modified by ECOC teach several temperature dependencies of wavelength characteristics, especially in ECOC Section 2. A dependence of 12.5 pm/Degree Centigrade is taught for the use of an athermal glass with fused silica.

17. Hall as modified by ECOC discloses the claimed invention except for a temperature dependency of a transmission wavelength characteristic set to be 25pm/Degree Centigrade or more.

18. Many materials are well known in the art and are widely available through catalog companies. Sapphire is a material that exhibits high mechanical strength, that operates in the extended IR spectral range and that has high chemical resistance.

19. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use sapphire for the material of Hall as modified by ECOC, since it has been held to be within the ordinary skill of a worker in the art to select a known material on the basis of its suitability for the intended use. One would have been motivated to use sapphire for the purpose of using a material that exhibits high mechanical strength, that operates in the extended IR spectral range and that has high chemical resistance to achieve a temperature dependency of a transmission wavelength characteristic set to be 25pm/Degree Centigrade or more. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945)

20. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall and ECOC in view of Shirasaki (US 5,982,488).

21. Regarding Claim 2, Figure 2 of Hall teaches an airgap etalon above with a fixing member transparent to incident light (36) and a transparent member (38).

22. Hall fails to an etalon system wherein the fixing member has a through-hole and fails to teach a first parallel member formed with an antireflection coating on one flat surface thereof, and the flat surface formed with said antireflection coating is joined to said flat surface of said

fixing member around said through-hole, and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member.

23. Shirasaki ('488) teaches the use of through-holes in etalons, especially where the material with the through-hole is used to the advantage of affecting the temperature dependency of a transmission wavelength characteristic (Figures 5A-6B) such that materials of dissimilar coefficients of thermal expansion are combined to affect the optical distance (Summary). The through-hole is further used for the advantage of allowing unobstructed signal transmission (Columns 9-10 and Figures 5B and 6B)

24. ECOC teaches antireflection coatings on the entrance and exit sides of an etalon (ECOC, Figure 3). Antireflection coatings are known in the art to be used for the purpose of preventing backreflections.

25. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a fixing member with a through-hole and the first parallel member formed with an antireflection coating on one flat surface thereof, and the flat surface formed with said antireflection coating is joined to said flat surface of said fixing member around said through-hole, and said transparent member is formed with an antireflection coating on the other flat surface thereof opposite to the joined surface to said second parallel member in the system of Hall as taught by the ECOC and Shirasaki references. The antireflection coatings are used for the purpose of preventing backreflections, and the through-hole is used to the advantage of affecting the temperature dependency of a transmission wavelength characteristic ('488, Figures 5A-6B) such that materials of dissimilar coefficients of thermal expansion are combined to affect

the optical distance ('488, Summary) and for allowing unobstructed signal transmission ('488, Columns 9-10 and Figures 5B and 6B).

Response to Arguments

26. Applicant's arguments filed 05/16/03 have been fully considered but they are not persuasive. Arguments regarding Hall's failure to teach a distance between the parallel flat surfaces and the expansion coefficient of each of said first and second parallel members as set to obtain temperature dependency of a transmission wavelength characteristic capable of compensating temperature dependency of incident light are not persuasive, since it is understood in the art that the dimensional stability of an optical material (referenced by Hall at Column 4, lines 43-45) greatly affects the passage of light through the material. The dimensional stability can be controlled by selection of the appropriate material. Hall further discusses the creation and maintenance of a gap as well as thicknesses of the parallel members to thereby link the selection of the dimensional stability (expansion coefficient) to the selection of distances between the parallel flat surfaces (Columns 4 and 5). Applicant also acknowledges that Hall and Shirasaki (ECOC) have teachings regarding the temperature dependency of the transmission wavelength characteristic (Page 5 of Remarks). Whether they teach reduction or otherwise is not relevant to claim 1, since the further argumentation that the Applicant encompasses reducing and increasing temperature dependency is not claimed.

27. Applicant's arguments with respect to claim 7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Excerpt from Laikin is of interest for elementary teachings on thermal considerations in lens systems, and for listing known optical materials and their corresponding attributes. Catalog excerpts from Melles Griot and CVI Laser are of interest for teaching characteristics of sapphire and other materials.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

31. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

ks
July 25, 2003

EDWARD J. GLICK
Supervisory Patent Examiner
TECHNOLOGY CENTER 2800